

# X-38 vehicle at JSC for modifications, new electrical components

The V-131R, one of two test flight prototypes for the X-38 emergency crew return vehicle, is in town for some upgrades. The vehicle had been with its original manufacturer, Scaled Composites, Inc. in Mojave, Calif. since February having some airframe modifications done. It is now back at JSC to have internal electrical components installed.

The most obvious modification to the vehicle was changing its outer mold line to match the actual space flight test vehicle, V-201, mold line. Designers also added a simulated docking ring and new fins so they could assess the structure's impact on the vehicle's aerodynamics.

"The aft surface is now more rounded and aerodynamic versus the more angular look it had previously," said Wayne Peterson, V-201 delivery manager. "It varies from front to back, but generally speaking, the upper surface was raised about six inches. However, because the vehicle is designed to descend with a high angle of attack, close to 40 degrees, the top-side structures likely won't affect its performance until the craft reaches the supersonic and transonic flight regimes."

Designers also incorporated a full-scale 7,500-square-foot parafoil and accompanying drogue chute to the vehicle in order

to get early test experience with the larger chutes. Previously, the V-131 had a 5,400-square-foot parafoil, but it will now use the larger parafoil destined for V-201. The space flight vehicle requires the larger chutes because it is larger and heavier than the atmospheric vehicles.

"To do that, we'll have to add several thousand pounds of ballast to try to get the wing loading to a reasonable level," explained Ed Robertson, V-131R delivery manager. "Additionally, we'll be flying parafoil guidance software in the flight computer rather than in a separate unit."

All of this entails significant electrical work inside the vehicle and inclusion of a high voltage system. The modifications on V-131R should be complete in March or April. V-132 is currently at Dryden Flight Research Center preparing for an early December drop test. ■



NASA JSC Photos S99-13593 and 13596 by Robert Markowitz  
Ann Sanders, X-38 co-op, and Greg Buoni remove the nose from the V-131R vehicle for internal electrical work. The vehicle (left) also has a new profile after changes were made to its composite exterior to match the actual space flight test vehicle.

## X-38 Needs You!

Are you interested in helping build the first new human spacecraft NASA has developed in the last two decades? Join the X-38 Project Team.

The X-38 Project Team is building a space flight test vehicle as a prototype for the Space Station Crew Return Vehicle. This vehicle, V-201, will fly on board the space shuttle in 2002, be deployed by the robotic arm, and fly the CRV mission from deorbit burn through touchdown.

X-38 is looking for civil servants – any level of experience, any pay grade – for a



NASA JSC Photo S99-14198 by Bill Stafford  
Getting together one last time are the current and former detailees of the X-38 Tile Team, from left, Claudia Hess, Marilyn Davison, Dale Martin, and Alex Dula.

12-month rotational assignment to bond thermal protection system tiles, blankets, and insulation to the V-201 skin panels. No engineering or technical training will be required.

Employees will report to the Manufacturing, Materials, and Process Technology Division, and return to their home organizations at the end of the tour.

If you are interested, contact Nicole Dickerson at 281-244-1613, or e-mail ndickers@ems.jsc.nasa.gov.

For details about the duties and responsibilities of the position, contact Joe Zamaitia of the Fabrication and Assembly Branch at 281-483-2260. ■

# Japanese components tested for space station software compatibility

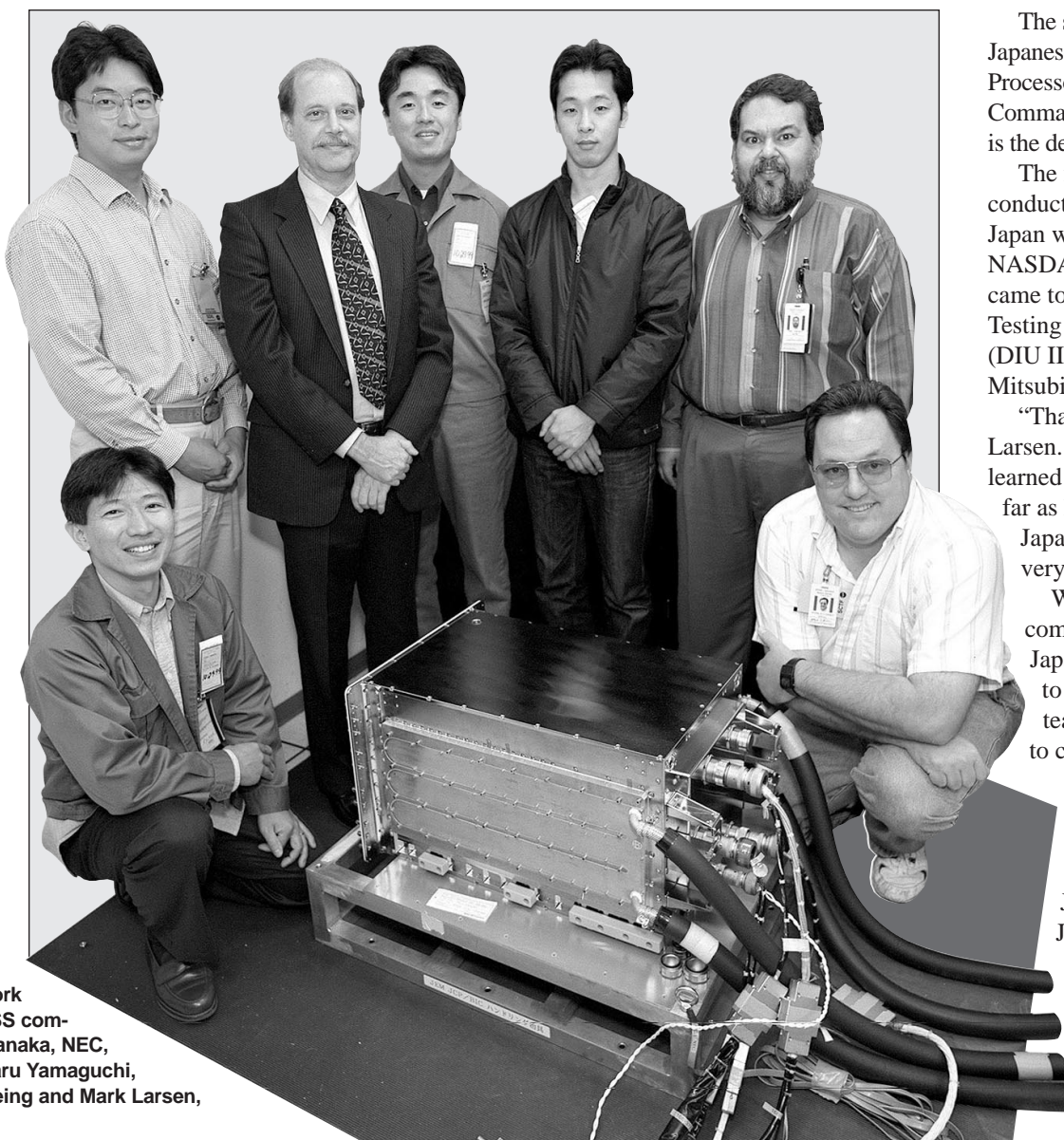
Representatives from NASDA, the Japanese space agency, and NEC Corporation, a Japanese engineering company, recently completed Early Integration Testing with Boeing engineers at the Software Verification Facility located in JSC's Sonny Carter Training Facility.

The teams completed the second in a series of three risk mitigation tests for the Japanese International Space Station components.

In October, four NASDA and NEC engineers worked with the Boeing Houston team to test the Japanese Experiment Module (JEM) Control Processor (JCP), the main processor for the Japanese ISS element. This is the first time the JCP has been connected with the ISS Command and Control Processor.

The tests verified communications protocols between the two processors.

"The tests went very successfully," said Mark Larsen, Boeing test director. "We uncovered some problems that otherwise we wouldn't have known about for some time. It's much easier, and cheaper to fix these problems now than later in the development life cycle."



Left to right: Representatives from the National Space Development Agency of Japan (NASDA) and NEC Corporation recently visited JSC to work with Boeing to test software for the Japanese ISS components. The testing team included Takahiko Tanaka, NEC, Tsuyoshi Ito, NASDA, John Selke, Boeing, Masaru Yamaguchi, NEC, Akira Ono, NEC, and Israel Gonzales, Boeing and Mark Larsen, test lead, Boeing.

The second part of the test included the Japanese robotic arm Management Data Processor (MDP), and its interface with the Command and Control Processor. Toshiba is the developer of the MDP.

The first ISS component software test conducted with representatives from Japan was in April 1999. At that time, NASDA and Mitsubishi representatives came to JSC to perform Early Integration Testing of the Data Interface Unit III (DIU III). The DIU is manufactured by Mitsubishi Heavy Industries.

"That was a flawless test," said Larsen. "It went very smoothly. And we learned a lot from each of these tests, as far as how to work better with our Japanese counterparts. They have been very cooperative."

When the testing in the U.S. is complete, all units will go back to Japan for any modifications needed to correct discovered flaws. The team plans to meet next in mid 2000 to conduct additional testing of the software interface components. At that time, they'll meet at the NASDA ISS testing facility in Tsukuba (pronounced scuba) Japan, for testing of the entire JEM interface.

A fourth test is slated for 2001, which will be a Stage Verification test against the final flight software here in Houston. ■